AIR QUALITY and GHG IMPACT ANALYSES

VALLEY PLAZA

CITY OF EL MONTE, CALIFORNIA

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ATMOSPHERIC SETTING

The climate of the El Monte area, as with all of Southern California, is governed largely by the strength and location of the semi-permanent high pressure center over the Pacific Ocean and the moderating effects of the nearby vast oceanic heat reservoir. Local climatic conditions are characterized by very warm summers, mild winters, infrequent rainfall, moderate daytime on-shore breezes, and comfortable humidities. Unfortunately, the same climatic conditions that create such a desirable living climate combine to severely restrict the ability of the local atmosphere to disperse the large volumes of air pollution generated by the population and industry attracted in part by the climate.

El Monte is situated in an area where the pollutants generated in coastal portions of the Los Angeles basin undergo photochemical reactions and then move inland across the project site during the daily sea breeze cycle. The resulting smog at times gives the western San Gabriel Valley some of the worst air quality in all of California. The worst air quality, however, has gradually been moving eastward. The area of heaviest ozone air pollution has gradually moved eastward from Pasadena in the 1960's to Glendora and even Upland/Ontario in the 1990's. Elevated smog levels nevertheless persist in the project area during the warmer months of the year. Despite dramatic improvement in air quality in the local area throughout the last several decades, the project site is expected to continue to experience some unhealthful air quality until beyond 2020.

Temperatures in the project vicinity average 62 degrees Fahrenheit annually with summer afternoons in the low 90's and winter mornings in the low 40's. Temperatures much above 100 or below 30 degrees occur infrequently only under unusual weather conditions and even then these limits are not far exceeded.

In contrast to the slow annual variation of temperature, precipitation is highly variable seasonally. Rainfall in the eastern portions of Los Angeles County averages 17 inches annually and falls almost exclusively from late October to early April. Summers are very dry with frequent periods of 4-5 months of no rain at all. Because much of the rainfall comes from the fringes of mid-latitude storms, a shift in the storm track of a few hundred miles can mean the difference between a very wet year and a year with drought conditions.

Winds across the project area are an important meteorological parameter because they control both the initial rate of dilution of locally generated air pollutant emissions as well as their regional trajectory. Local wind patterns show a fairly unidirectional daytime onshore flow from the SW-W with a very weak offshore return flow from the NE that is strongest on winter nights when the land is colder than the ocean. The onshore winds during the day average 6-8 mph, while the offshore flow is often calm or drifts slowly westward at 1-3 mph. During the daytime, any locally generated air emissions are thus transported eastward toward San Bernardino and Cajon Pass without generating any localized air quality impacts.

The drainage winds which move slowly across the area at night have some potential for localized stagnation. Fortunately, these winds have their origin in the San Gabriel Mountains where background pollution levels are low such that any localized contributions do not create any unhealthful impacts. The wind distribution is such that nominal project-related air quality impacts occur more on a regional scale rather than in the immediate project area. One other important wind condition occurs when a high pressure center forms over the western United States with sinking air forced seaward through local canyons and mountain passes. The air warms by compression and relative humidities drop dramatically. The dry, gusty winds from the N-NE create dust nuisance potential around areas of soil disturbance such as construction sites and sometimes create serious visibility and vehicle safety problems for vehicles on area freeways.

In conjunction with the two dominant wind regimes that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. The summer on-shore flow is capped by a massive dome of warm, sinking air which caps a shallow layer of cooler ocean air. These marine/ subsidence inversions act like a giant lid over the basin. They allow for local mixing of emissions, but they confine the entire polluted air mass within the basin until it escapes into the desert or along the thermal chimneys formed along heated mountain slopes.

In winter, when the air near the ground cools while the air aloft remains warm, radiation inversions are formed that trap low-level emissions such as automobile exhaust near their source. As background levels of primary vehicular exhaust rise during the seaward return flow, the combination of rising non-local baseline levels plus emissions trapped locally by these radiation inversions creates micro-scale air pollution "hot spots" near freeways, shopping centers and other traffic concentrations. Because the incoming air draining off the mountains into the San Gabriel Valley during nocturnal radiation inversion conditions is relatively clean, the summer subsidence inversions are a far more critical factor in determining area air quality than the winter time local trapping inversions.

AIR QUALITY SETTING

AMBIENT AIR QUALITY STANDARDS (AAQS)

In order to gauge the significance of the air quality impacts of the proposed project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule, which extended and established a new attainment deadline for ozone for the year 2021. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their required attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to “non-attainment” for the 8-hour ozone standard.

Table 1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Respirable Particulate Matter (PM10)[8]	24 Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		—		
Fine Particulate Matter (PM2.5)[8]	24 Hour	—	—	35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	12.0 μg/m^3	15 μg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[9]	1 Hour	0.18 ppm (339 μg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 μg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)		0.053 ppm (100 μg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1 Hour	0.25 ppm (655 μg/m^3)	Ultraviolet Fluorescence	75 ppb (196 μg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 μg/m^3)	
	24 Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (for certain areas)[10]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[10]	—	
Lead[11,12]	30 Day Average	1.5 μg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 μg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 μg/m^3		
Visibility Reducing Particles[13]	8 Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24 Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

See footnotes on next page …

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Table 1 (continued)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

10. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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Table 2
Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the exposure period for the federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the ARB adopted an annual state standard for nitrogen dioxide ($NO_{2)}$ that is more stringent than the corresponding federal standard, and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5 to 10 micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted. In December, 2012, the federal annual standard for PM-2.5 was reduced from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ which matches the California AAQS. The severity of the basin's non-attainment status for PM-2.5 may be increased by this action and thus require accelerated planning for future PM-2.5 attainment.

In response to continuing evidence that ozone exposure at levels just meeting federal clean air standards is demonstrably unhealthful, EPA had proposed a further strengthening of the 8-hour standard. A new 8-hour ozone standard was adopted in 2014, but the final numerical value has not yet been selected. It will require additional public input in 2016, then three years of ambient data collection, then 2 years of non-attainment findings and planning protocol adoption, then several years of plan development and approval. Final air quality plans for the new standard are likely to be adopted around 2025. Ultimate attainment of the new standard in ozone problem areas such as Southern California might be close to 2030.

A new federal one-hour standard for nitrogen dioxide (NO_2) has also recently been adopted. This standard is more stringent than the existing state standard. Based upon air quality monitoring data in the South Coast Air Basin, the California Air Resources Board has requested the EPA to designate the basin as being in attainment for this standard. The federal standard for sulfur dioxide (SO_2) was also recently revised. However, with minimal combustion of coal and mandatory use of low sulfur fuels in California, SO_2 is typically not a problem pollutant.

BASELINE AIR QUALITY

Long-term air quality monitoring is carried out by the South Coast Air Quality Management District (SCAQMD) at various monitoring stations. There are no nearby stations that monitor the full spectrum of pollutants. Ozone, carbon monoxide, PM-2.5 and nitrogen oxides are monitored at the Pico Rivera facility, while 10-micron diameter particulate matter (PM-10) is measured at the Azusa station. Table 3 summarizes the last five years of monitoring data from a composite of these data resources. The following conclusions can be drawn from this data:

a. Photochemical smog (ozone) levels occasionally exceed standards. The 8-hour state ozone standard as well as the 1-hour state standard have been exceeded on approximately one percent of all days in the past five years. The 8-hour federal standard has been exceeded four times for the same period. While ozone levels are still high, they are much lower than 10 to 20 years ago. Attainment of all clean air standards in the project vicinity is not likely to occur soon, but the severity and frequency of violations is expected to continue to slowly decline during the current decade

b. Measurements of carbon monoxide and nitrogen dioxide have shown very low baseline levels in comparison to standards.

c. Respirable dust (PM-10) levels exceed the state standard on approximately 11 percent of measurement days, but the less stringent federal PM-10 standard has not been violated once for the same period. Year to year fluctuations of overall maximum 24-hour PM-10 levels seem to follow no discernable trend, though 2011 had the lowest maximum 24-hour concentration in recent history.

d. A substantial fraction of PM-10 is comprised of ultra-small diameter particulates capable of being inhaled into deep lung tissue (PM-2.5). Year 2010 and 2013 showed the fewest violations in recent years. Both the frequency of violations of particulate standards, as well as high percentage of PM-2.5, are occasional air quality concerns in the project area. However, less than one percent of all days exceeded the current national 24-hour standard of 35 $\mu g/m^3$ from 2009-2013.

Although complete attainment of every clean air standard is not yet imminent, extrapolation of the steady improvement trend suggests that such attainment could occur within the reasonably near future.

Table 3
Air Quality Monitoring Summary (2009-2013)
(Number of Days Standards Were Exceeded, and
Maximum Levels During Such Violations)
(Entries shown as ratios = samples exceeding standard/samples taken)

Pollutant/Standard	2009	2010	2011	2012	2013
Ozone					
1-Hour > 0.09 ppm (S)	8	1	1	5	2
8-Hour > 0.07 ppm (S)	6	1	1	6	3
8- Hour > 0.075 ppm (F)	3	1	0	0	0
Max. 1-Hour Conc. (ppm)	0.13	0.11	0.10	0.11	0.10
Max. 8-Hour Conc. (ppm)	0.10	0.09	0.07	0.08	0.07
Carbon Monoxide					
8-Hour > 9. ppm (S, F)	0	0	0	0	0
Max 8-Hour Conc. (ppm)	2.1	1.9	2.4	2.2	2.0
Nitrogen Dioxide					
1-Hour > 0.18 ppm (S)	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.10	0.08	0.09	0.08	0.08
Inhalable Particulates (PM-10)					
24-Hour > 50 $\mu g/m^3$ (S)	7/52	5/55	8/61	6/61	6/61
24-Hour > 150 $\mu g/m^3$ (F)	0/52	0/55	0/61	0/61	0/61
Max. 24-Hr. Conc. ($\mu g/m^3$)	72.	68.	63.	78.	76.
Ultra-Fine Particulates (PM-2.5)					
24-Hour > 35 $\mu g/m^3$ (F)	2/118	0/117	1/114	1/119	0/114
Max. 24-Hr. Conc. ($\mu g/m^3$)	71.0	34.9	41.2	45.3	29.1

S=State Standard
F=Federal Standard
Source: South Coast AQMD – Pico Rivera Air Monitoring Station for Ozone, CO, NOx and PM-2.5, Azusa Monitoring Station for PM-10
data: www.arb.ca.gov/adam/

AIR QUALITY PLANNING

The Federal Clean Air Act (1977 Amendments) required that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards. The SCAB could not meet the deadlines for ozone, nitrogen dioxide, carbon monoxide, or PM-10. In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and revised it several times as earlier attainment forecasts were shown to be overly optimistic.

The 1990 Federal Clean Air Act Amendment (CAAA) required that all states with air-sheds with "serious" or worse ozone problems submit a revision to the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised and approved over the past decade. The most current regional attainment emissions forecast for ozone precursors (ROG and NOx) and for carbon monoxide (CO) and for particulate matter are shown in Table 4. Substantial reductions in emissions of ROG, NOx and CO are forecast to continue throughout the next several decades. Unless new particulate control programs are implemented, PM-10 and PM-2.5 are forecast to slightly increase.

The Air Quality Management District (AQMD) adopted an updated clean air "blueprint" in August 2003. The 2003 Air Quality Management Plan (AQMP) was approved by the EPA in 2004. The AQMP outlined the air pollution measures needed to meet federal health-based standards for ozone by 2010 and for particulates (PM-10) by 2006. The 2003 AQMP was based upon the federal one-hour ozone standard which was revoked late in 2005 and replaced by an 8-hour federal standard. Because of the revocation of the hourly standard, a new air quality planning cycle was initiated.

With re-designation of the air basin as non-attainment for the 8-hour ozone standard, a new attainment plan was developed. This plan shifted most of the one-hour ozone standard attainment strategies to the 8-hour standard. As previously noted, the attainment date was to "slip" from 2010 to 2021. The updated attainment plan also includes strategies for ultimately meeting the federal PM-2.5 standard.

Because projected attainment by 2021 requires control technologies that do not exist yet, the SCAQMD requested a voluntary "bump-up" from a "severe non-attainment" area to an "extreme non-attainment" designation for ozone. The extreme designation will allow a longer time period for these technologies to develop. If attainment cannot be demonstrated within the specified deadline without relying on "black-box" measures, EPA would have been required to impose sanctions on the region had the bump-up request not been approved. In April 2010, the EPA approved the change in the non-attainment designation from "severe-17" to "extreme." This reclassification sets a later attainment deadline (2024), but also requires the air basin to adopt even more stringent emissions controls.

Table 4
South Coast Air Basin Emissions Forecasts (Emissions in tons/day)

Pollutant	2010[a]	2015[b]	2020[b]	2025[b]
NOx	603	451	357	289
VOC	544	429	400	393
PM-10	160	155	161	165
PM-2.5	71	67	67	68

[a]2010 Base Year.
[b]With current emissions reduction programs and adopted growth forecasts.
Source: California Air Resources Board, 2013 Almanac of Air Quality

In other air quality attainment plan reviews, EPA has disapproved part of the SCAB PM-2.5 attainment plan included in the AQMP. EPA has stated that the current attainment plan relies on PM-2.5 control regulations that have not yet been approved or implemented. It is expected that a number of rules that are pending approval will remove the identified deficiencies. If these issues are not resolved within the next several years, federal funding sanctions for transportation projects could result. The 2012 AQMP included in the ARB submittal to EPA as part of the California State Implementation Plan (SIP) is expected to remedy identified PM-2.5 planning deficiencies.

The federal Clean Air Act requires that non-attainment air basins have EPA approved attainment plans in place. This requirement includes the federal one-hour ozone standard even though that standard was revoked around eight years ago. There was no approved attainment plan for the one-hour federal standard at the time of revocation. Through a legal quirk, the SCAQMD is now required to develop an AQMP for the long since revoked one-hour federal ozone standard. Because the 2012 AQMP contains a number of control measures for the 8-hour ozone standard that are equally effective for one-hour levels, the 2012 AQMP is believed to satisfy hourly attainment planning requirements.

The proposed project does not directly relate to the AQMP in that there are no specific air quality programs or regulations governing mixed use projects. Conformity with adopted plans, forecasts and programs relative to population, housing, employment and land use is the primary yardstick by which impact significance of planned growth is determined. The SCAQMD, however, while acknowledging that the AQMP is a growth-accommodating document, does not favor designating regional impacts as less-than-significant just because the proposed development is consistent with regional growth projections. Air quality impact significance for the proposed project has therefore been analyzed on a project-specific basis.

AIR QUALITY IMPACT

STANDARDS OF SIGNIFICANCE

Air quality impacts are considered "significant" if they cause clean air standards to be violated where they are currently met, or if they "substantially" contribute to an existing violation of standards. Any substantial emissions of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, would also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following five tests of air quality impact significance. A project would have a potentially significant impact if it:

a. Conflicts with or obstructs implementation of the applicable air quality plan.

b. Violates any air quality standard or contributes substantially to an existing or projected air quality violation.

c. Results in a cumulatively considerable net increase of any criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

d. Exposes sensitive receptors to substantial pollutant concentrations.

e. Creates objectionable odors affecting a substantial number of people.

Primary Pollutants

Air quality impacts generally occur on two scales of motion. Near an individual source of emissions or a collection of sources such as a crowded intersection or parking lot, levels of those pollutants that are emitted in their already unhealthful form will be highest. Carbon monoxide (CO) is an example of such a pollutant. Primary pollutant impacts can generally be evaluated directly in comparison to appropriate clean air standards. Violations of these standards where they are currently met, or a measurable worsening of an existing or future violation, would be considered a significant impact. Many particulates, especially fugitive dust emissions, are also primary pollutants. Because of the non-attainment status of the South Coast Air Basin (SCAB) for PM-10, an aggressive dust control program is required to control fugitive dust during project construction.

Secondary Pollutants

Many pollutants, however, require time to transform from a more benign form to a more unhealthful contaminant. Their impact occurs regionally far from the source. Their incremental regional impact is minute on an individual basis and cannot be quantified except through complex photochemical computer models. Analysis of significance of such emissions is based upon a specified amount of emissions (pounds, tons, etc.) even though there is no way to translate those emissions directly into a corresponding ambient air quality impact.

Because of the chemical complexity of primary versus secondary pollutants, the SCAQMD has designated significant emissions levels as surrogates for evaluating regional air quality impact significance independent of chemical transformation processes. Projects with daily emissions that exceed any of the following emission thresholds are recommended by the SCAQMD to be considered significant under CEQA guidelines.

Table 5
Daily Emissions Thresholds

Pollutant	Construction	Operations
ROG	75	55
NOx	100	55
CO	550	550
PM-10	150	150
PM-2.5	55	55
SOx	150	150
Lead	3	3

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

Additional Indicators

In its CEQA Handbook, the SCAQMD also states that additional indicators should be used as screening criteria to determine the need for further analysis with respect to air quality. The additional indicators are as follows:

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation.
- Project could result in population increases within the regional statistical area which would be in excess of that projected in the AQMP and in other than planned locations for the project's build-out year.
- Project could generate vehicle trips that cause a CO hot spot.

The SCAQMD CEQA Handbook also identifies various secondary significance criteria related to toxic, hazardous or odorous air contaminants. Except for the small diameter particulate matter ("PM-2.5") fraction of diesel exhaust generated by heavy construction equipment and project-related diesel truck traffic, there are no secondary impact indicators associated with project construction or operations.

For PM-2.5 exhaust emissions, recently adopted policies require the gradual conversion of delivery fleets to diesel alternatives, or the use of "clean" diesel if their emissions are demonstrated to be as low as those from alternative fuels. Because health risks from toxic air contaminants (TAC's) are cumulative over an assumed 70-year lifespan, measurable off-site public health risk from diesel TAC exposure would occur for only a brief portion of a project lifetime, and only in dilute quantity.

SENSITIVE RECEPTORS

Air quality impacts are analyzed relative to those persons with the greatest sensitivity to air pollution exposure. Such persons are called "sensitive receptors." Sensitive population groups include young children, the elderly and the acutely and chronically ill (especially those with cardio-respiratory disease). Residential areas adjacent to a proposed site are considered to be sensitive to air pollution exposure because they may be occupied for extended periods, and residents may be outdoors when exposure is highest. The residential uses along the southern project perimeter would be considered the closest sensitive receptors.

CONSTRUCTION ACTIVITY IMPACTS

Dust is typically the primary concern during construction of new buildings. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions." Emission rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). These parameters are not known with any reasonable certainty prior to project development and may change from day to day. Any assignment of specific parameters to an unknown future date is speculative and conjectural.

Because of the inherent uncertainty in the predictive factors for estimating fugitive dust generation, regulatory agencies typically use one universal "default" factor based on the area disturbed assuming that all other input parameters into emission rate prediction fall into midrange average values. This assumption may or may not be totally applicable to site-specific conditions on the proposed project site. As noted previously, emissions estimation for project-specific fugitive dust sources is therefore characterized by a considerable degree of imprecision.

Average daily PM-10 emissions during site grading and other disturbance are shown estimated to be about 10 pounds per acre. This estimate presumes the use of reasonably available control measures (RACMs). The SCAQMD requires the use of best available control measures (BACMs) for fugitive dust from construction activities.

Current research in particulate-exposure health suggests that the most adverse effects derive from ultra-small diameter particulate matter comprised of chemically reactive pollutants such as sulfates, nitrates or organic material. A national clean air standard for particulate matter of 2.5 microns or smaller in diameter (called "PM-2.5") was adopted in 1997. A limited amount of construction activity particulate matter is in the PM-2.5 range. PM-2.5 emissions are estimated to comprise 10-20 percent of PM-10.

CalEEMod was developed by the SCAQMD to provide a model by which to calculate both construction emissions and operational emissions from a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions.

Although exhaust emissions will result from on and off-site heavy equipment, the exact types and numbers of equipment will vary among contractors such that such emissions cannot be quantified with certainty. Estimated construction emissions were modeled using CalEEMod2013.2.2 to identify maximum daily emissions for each pollutant during project construction.

The proposed development, consisting of 76 condominiums, 18,440 square feet of retail space, 2,500 square feet of office use, a 12,600 square foot restaurant, a 179 space underground parking lot and a 125 space surface parking lot was modeled in CalEEMod2013.2.2. The existing 47,000 square foot car dealership was assumed to be demolished as part of the project construction. The modeled prototype construction equipment fleet and schedule is indicated in Table 6 and based on CalEEMod defaults for a project of this size.

Table 6
Construction Activity Equipment Fleet

Phase Name and Duration	Equipment
Demolition (30 days) 47,000 sf	1 Concrete Saw
	1 Dozer
	3 Excavators
Grading (20 days)	1 Grader
	1 Excavator
	1 Dozer
	3 Loader/Backhoes
Construction (230 days)	1 Crane
	3 Forklifts
	1 Generator Set
	1 Welder
	3 Loader/Backhoes
Paving (20 days)	2 Pavers
	2 Rollers
	2 Paving Equipment

Utilizing this indicated equipment fleet shown in Tables 6 the following worst case daily construction emissions are calculated by CalEEMod and are listed in Table 7.

Table 7
Construction Activity Emissions
Maximum Daily Emissions (pounds/day)

Maximal Construction Emissions	ROG	NOx	CO	SO_2	PM-10	PM-2.5
2016						
Unmitigated	17.9	48.7	38.1	0.1	8.9	5.4
Mitigated	17.9	48.7	38.1	0.1	4.9	3.4
2017						
Unmitigated	17.6	31.9	31.5	0.1	3.8	2.4
Mitigated	17.6	31.9	31.5	0.1	3.8	2.4
SCAQMD Thresholds	75	100	550	150	150	55

Peak daily construction activity emissions are estimated to be well below SCAQMD CEQA thresholds without the need for added mitigation. The only model-based mitigation measured applied for this project was watering exposed dirt surfaces at least three times per day to minimize the generation of fugitive dust generation during grading.

Construction equipment exhaust contains carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24-hour per day, 365 days per year, 70-year lifetime exposure. The SCAQMD does not generally require the analysis of construction-related diesel emissions relative to health risk due to the short period for which the majority of diesel exhaust would occur. Health risk analyses are typically assessed over a 9-, 30-, or 70-year timeframe and not over a relatively brief construction period due to the lack of health risk associated with such a brief exposure.

LOCALIZED SIGNIFICANCE THRESHOLDS

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Localized Significance Thresholds (LSTs). LSTs were developed in response to Governing Board’s Environmental Justice Enhancement Initiative 1-4 and the LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD’s Mobile Source Committee in February 2005.

Use of an LST analysis for a project is optional. For the proposed project, the primary source of possible LST impact would be during construction. LSTs are applicable for a sensitive receptor where it is possible that an individual could remain for 24 hours such as a residence, hospital or convalescent facility.

LST screening tables are available for 25, 50, 100, 200 and 500 meter source-receptor distances. For this project the nearest sensitive use is the adjacent residences and therefore a 25 meter distance was selected for analysis.

LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

The SCAQMD has issued guidance on applying CalEEMod to LSTs. LST pollutant screening level concentration data is currently published for 1, 2 and 5 acre sites for varying distances. Since CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily soil disturbance activity possible for each piece of equipment, the following tables should be used to determine the maximum daily disturbed-acreage for comparison to LSTs.

Table 8
Maximum Daily Disturbed Acreage per Equipment Type

Equipment Type	Acres/8-hr-day
Crawler Tractor	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Based on this table, the proposed project will result in 1.0 disturbed daily acre during peak construction grading activity:

(1 grader x 0.5 +dozer x 0.5= 1.0 acre disturbed).

The following thresholds and emissions in Table 9 are therefore determined (pounds per day):

Table 9
LST and Project Emissions (pounds/day)

LST 1.0 acres/25 meters East San Gabriel Valley	CO	NOx	PM-10	PM-2.5
Max On-Site Emissions	625	89	5	3
Demolition				
Unmitigated	35	46	5	3
Mitigated	35	46	3	2
Grading				
Unmitigated	26	38	9	5
Mitigated	26	38	5	3
Construction				
Unmitigated	19	29	2	2
Mitigated	19	29	2	2
Paving				

Unmitigated	15	20	1	1
Mitigated	15	20	1	1

CalEEMod Output in Appendix A

LSTs were compared to the maximum daily construction activities. As seen in Table 10, emissions meet the LST for construction thresholds. LST impacts are less-than-significant.

OPERATIONAL IMPACTS

The project would generate 2,766 daily trips using trip generation numbers provided by the project traffic consultant. Operational emissions were calculated using CalEEMod2013.2.2 for an assumed project build-out year of 2017 as a target for full occupancy. The operational impacts are shown in Table 10. As shown, operational emissions will not exceed applicable SCAQMD operational emissions CEQA thresholds of significance.

Table 10
Daily Operational Impacts

	Operational Emissions (lbs/day)					
Source	**ROG**	**NOx**	**CO**	**SO_2**	**PM-10**	**PM-2.5**
Area	5.8*	0.1	6.4	0.0	0.1	0.1
Energy	0.1	1.0	0.8	0.0	0.1	0.1
Mobile	8.1	16.7	71.8	0.2	10.7	3.0
Total	**14.0**	**17.8**	**78.9**	**0.2**	**10.9**	**3.2**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No

Source: CalEEMod2013.2.2 Output in Appendix
*assumes use of natural gas heaths for residential use

FREEWAY PROXIMITY IMPACTS

The California Air Resources Board (CARB) developed land use siting guidelines to minimize residential exposure to diesel particulate matter (DPM), a known carcinogen. These guidelines recommend that new residences maintain a 500-foot setback from freeways and high volume arterials unless it is demonstrated that unacceptable levels of risk do not exist on a local scale. The closest point of the proposed project is within 500 feet of the San Bernardino Freeway travel lanes.

The closest proposed residences are only marginally within the potential zone of impact. The CARB guidelines were developed ten years ago with diesel trucks becoming dramatically cleaner in the last decade. A health risk screening analysis was performed using conservative input parameters for this site. If the screening analysis predicted an acceptable level of DPM exposure risk, a more detailed health risk analysis (HRA) is not considered to be warranted. EPA’s AERSCREEN dispersion model was applied to DPM emissions from 3,439 diesel trucks using the freeway each day. The model input/output and impact discussion are included in the appendix.

Over a 70-year lifetime, the average DPM emission factor is 0.04 grams per mile. The EPA dispersion model predicts an excess individual cancer risk of 3.86 in a million at the closest proposed residence. If this risk is adjusted to account for greater exposure sensitivity among infants and young children, the screening level risk becomes 6.56 in a million. This value is less than the ten in a million significance threshold recommended by the SCAQMD in its CEQA Air Quality Handbook. Freeway proximity to the proposed project is not a citing issue.

CONSTRUCTION EMISSIONS MITIGATION

Construction activities are not anticipated to cause dust emissions to exceed SCAQMD CEQA thresholds. Nevertheless, mitigation through enhanced dust control measures is recommended for use because of the non-attainment status of the air basin and proximity of adjacent residential uses. Recommended mitigation includes:

Fugitive Dust Control

- Apply soil stabilizers or moisten inactive areas.
- Prepare a high wind dust control plan.
- Address previously disturbed areas if subsequent construction is delayed.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically 2-3 times/day).
- Cover all stock piles with tarps at the end of each day or as needed.
- Provide water spray during loading and unloading of earthen materials.
- Minimize in-out traffic from construction zone
- Cover all trucks hauling dirt, sand, or loose material and require all trucks to maintain at least two feet of freeboard
- Sweep streets daily if visible soil material is carried out from the construction site

Similarly, ozone precursor emissions (ROG and NOx) are calculated to be below SCAQMD CEQA thresholds. However, because of the regional non-attainment for photochemical smog, the use of reasonably available control measures for diesel exhaust is recommended. Combustion emissions control includes:

Exhaust Emissions Control

- Utilize well-tuned off-road construction equipment.
- Establish a preference for contractors using Tier 3 or better heavy equipment.
- Enforce 5-minute idling limits for both on-road trucks and off-road equipment.

GREENHOUSE GAS EMISSIONS

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Require the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual, to be achieved by 2020.
- Must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, from greater use of renewable energy and from increased structural energy efficiency. Additionally, through the California Climate Action Registry (CCAR now called the Climate Action Reserve), general and industry-specific protocols for assessing and reporting GHG emissions have been developed. GHG sources are categorized into direct sources (i.e. company owned) and indirect sources (i.e. not company owned). Direct sources include combustion emissions from on-and off-road mobile sources, and fugitive emissions. Indirect sources include off-site electricity generation and non-company owned mobile sources.

THRESHOLDS OF SIGNIFICANCE

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,
- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to “select the model or methodology it considers most appropriate.” The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

The significance of those emissions then must be evaluated; the selection of a threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The guidelines are clear that they do not support a zero net emissions threshold. If the lead agency does not have sufficient expertise in evaluating GHG impacts, it may rely on thresholds adopted by an agency with greater expertise.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons (MT) CO_2 equivalent/year. In September 2010, the Working Group released revisions which recommended a threshold of 3,500 MT CO_2e for projects with residential use. This 3,500 MT/year recommendation has been used as a guideline for this analysis. In the absence of an adopted numerical threshold of significance, project related GHG emissions in excess of the guideline level are presumed to trigger a requirement for enhanced GHG reduction at the project level.

PROJECT RELATED GHG EMISSIONS GENERATION

Construction Activity GHG Emissions

The build-out timetable for this project is assumed to be less than two years. During project construction, the CalEEMod2013.2.2 computer model predicts that the construction activities will generate the annual CO_2e emissions identified in Table 11.

Table 11
Construction Emissions (Metric Tons CO_2e)

	CO_2e
Year 2015	608.7
Year 2016	43.6
Total	652.3
Amortized	**21.7**

*CalEEMod Output provided in Appendix A

SCAQMD GHG emissions policy from construction activities is to amortize emissions over a 30-year lifetime. The amortized level is also provided. GHG impacts from construction are considered individually less-than-significant.

Project Operational GHG Emissions

The input assumptions for operational GHG emissions calculations, and the GHG conversion from consumption to annual regional CO_2(e) emissions are summarized in the CalEEMod2013.2.2 output files found in the appendix of this report.

The total operational and annualized construction emissions are identified in Table 12.

Table 12
Operational Emissions

Consumption Source	**MT CO_2(e) tons/year**
Area Sources*	17.8
Energy Utilization	689.6
Mobile Source	2,149.3
Solid Waste Generation	93.8
Water Consumption	67.0
Annualized Construction	21.7
Total	**3,039.2**
Guideline Threshold	3,500

*assumes natural gas hearths for residential use

This total is below the guideline threshold of 3,500 MTY CO_2e threshold suggested by the SCAQMD.

CONSISTENCY WITH GHG PLANS, PROGRAMS AND POLICIES

The City of El Monte has not yet developed a Greenhouse Gas Reduction Plan. The City has not adopted regulations for the purpose of reducing GHGs applicable to this project. The applicable GHG planning document is AB-32. As discussed above, the project is not expected to result in a significant increase in GHG emissions. As a result, the project results in GHG emissions below the recommended SCAQMD threshold. Therefore, the project would not conflict with any applicable plan, policy, or regulation to reduce GHG emissions.

APPENDIX

CALEEMOD2013.2.2 COMPUTER MODEL OUTPUT

HEALTH RISK SCREENING ANALYSIS

HEALTH RISK SCREENING ANALYSES

VALLEY PLAZA

EL MONTE, CALIFORNIA

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Date:

June 19, 2015

Project No.: P15-008 AQ

INTRODUCTION

On April 28, 2005, the California Air Resources Board approved the adoption of a handbook entitled "Proposed Air Quality and Land Use Handbook: A Community Health Perspective." A key recommendation in the handbook was that new sensitive land uses should not be sited within 500 feet of a freeway. For freeway proximity, the health risk derives primarily from diesel particulate matter (DPM). DPM emissions from trucks have decreased substantially in the last ten years since the handbook was released.

Health risk as a dose:response relationship is assumed to occur over a 70-year lifetime. The estimated risk associated with residential proximity to roadways thus entails a projection of diesel exhaust characteristics between now and 2085.

One corner of the proposed project site is within 500 feet of the I-10 Freeway. Most of the site is outside the 500-foot setback recommendation. If the site were squarely within the ARB's risk avoidance zone, a site-specific health risk assessment (HRA) would be an appropriate requirement for discretionary approvals. However, because the site is only marginally within that zone and because those recommendations are based upon emissions data that is no longer completely applicable, a health risk screening (HRS) approach was undertaken. If the HRS can demonstrate an acceptable level of risk with appropriately conservative assumptions, a full-brown HRA would not be necessary for the proposed project.

HEALTH RISK SCREENING ASSESSMENT

Diesel exhaust is an identified carcinogen. Cancer risk increases with intensity and duration of exposure. In the absence of a completely safe exposure level, the SCAQMD has adopted a prudent risk avoidance level based upon the overall risk experience in a lifetime.

The risk level of 10 in a million under conservative exposure assumptions (never leaving the same spot and never going inside a structure in an entire lifetime) is considered to be less-than-significant (SCAQMD CEQA Manual, 1993). A risk of less than one in a million is considered completely negligible.

The individual cancer risk to the proposed development located near to the I-10 freeway in El Monte was calculated using an EPA screening level dispersion model which predicts the downwind concentration of DPM to which residential receptors could be exposed. The AERSCREEN air dispersion model was used to evaluate concentrations of DPM and PM2.5 from diesel exhaust.

A DPM exposure was calculated for truck exhaust emissions. Truck volumes were obtained from the California DOT Traffic Census website (http://traffic-counts.dot.ca.gov/). The study counted 3,439 heavy diesel trucks per day on the segment of the I-10 adjacent to the project site in 2013. An annual (70 year) average exposure was determined assuming state and national DPM control programs are presumed to increase in effectiveness as older, "dirtier" trucks wear out. DPM emissions from trucks are shown to gradually decline in the future according to EMFAC2011, the California Air Resources Board tool for estimating emissions from on-road vehicles which was used to calculate vehicular emissions associated with heavy duty diesel trucks. EMFAC2011 emissions calculations only extend to 2035. DPM emissions were shown to gradually decline between now and 2035, and then assumed to remain at the 2035 level until 2085. An average PM-2.5 emission rate of 0.04 grams per mile was assumed to be a reasonable average for the 70 year time period. The risk zone for any resident of the proposed El Monte project is estimated to extend for 500 feet in either direction for a 1,000 foot impact zone.

Therefore, the DPM emission rate (lbs/hour) is calculated as follows:

3,439 trucks/day x 0.04 grams/mile x 453 grams/lb x .2 mile x 1 day/24 hours = .0025 lbs/hour

As shown in the attached AERSCREEN output file, the maximum one hour PM-2.5 concentration is calculated to be 0.1286 $\mu g/m^3$. The hourly to annual scaling factor is 0.1. AERSCREEN output thus indicates that freeway exposure will produce a maximum annual DPM concentration of 0.01286 $\mu g/m^3$. The excess individual cancer risk factor for DPM exposure is approximately 300 in a million per 1 $\mu g/m^3$ of lifetime exposure. Therefore, the maximal risk would be 300 x 0.01286 $\mu g/m^3$ = 3.858 in a million. The maximum individual cancer risk would be below the 10 in a million significance threshold.

The California Office of Environmental Health Hazard Assessment (OEHHA) guidelines use a weighted multiplier of 1.7 to account for increased sensitivity for infants and adolescents during their assumed 70 year life cycle. The resulting risk of 6.56 in a million would still be below the 10 in a million significance threshold. Even with ultra-conservative exposure assumptions (never leaving the home, never inside), the calculated risk is well below the ten in a million significance level.

Attachment

AERSCREEN Model
Input/Output Data

AERSCREEN 11126 / AERMOD 1135 02/25/15
13:08:56

TITLE: El Monte HRA

***************************** AREA PARAMETERS ****************************

SOURCE EMISSION RATE: 0.315E-03 g/s 0.250E-02 lb/hr

AREA EMISSION RATE: 0.199E-07 g/(s-m2) 0.158E-06 lb/(hr-m2)
AREA HEIGHT: 3.05 meters 10.00 feet
AREA SOURCE LONG SIDE: 304.80 meters 1000.00 feet
AREA SOURCE SHORT SIDE: 51.82 meters 170.00 feet
INITIAL VERTICAL DIMENSION: 4.57 meters 15.00 feet
RURAL OR URBAN: URBAN
POPULATION: 50000

INITIAL PROBE DISTANCE = 5000. meters 16404. feet

********************** BUILDING DOWNWASH PARAMETERS *********************

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

************************* FLOW SECTOR ANALYSIS ***************************
25 meter receptor spacing: 1. meters - 5000. meters

MAXIMUM IMPACT RECEPTOR

Zo SURFACE 1-HR CONC RADIAL DIST TEMPORAL
SECTOR ROUGHNESS (ug/m3) (deg) (m) PERIOD

1* 1.000 0.1284 0 150.0 WIN
* = worst case diagonal

********************* MAKEMET METEOROLOGY PARAMETERS ********************

MIN/MAX TEMPERATURE: 249.8 / 310.9 (K)

MINIMUM WIND SPEED: 2.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	01	01	1	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-37.34	0.346	-9.000	0.020	-999.	468.	85.2	1.000	1.50	0.35	2.50

HT	REF TA	HT
10.0	249.8	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	01	01	1	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-37.34	0.346	-9.000	0.020	-999.	468.	85.2	1.000	1.50	0.35	2.50

HT	REF TA	HT
10.0	249.8	2.0

************************ AERSCREEN AUTOMATED DISTANCES **********************

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
1.00	0.1133	2525.00	0.1106E-02
25.00	0.1173	2550.00	0.1091E-02
50.00	0.1206	2575.00	0.1076E-02
75.00	0.1233	2600.00	0.1062E-02
100.00	0.1251	2625.00	0.1048E-02
125.00	0.1269	2650.00	0.1035E-02
150.00	0.1284	2675.00	0.1021E-02
175.00	0.9123E-01	2700.00	0.1008E-02
200.00	0.6261E-01	2725.00	0.9957E-03
225.00	0.4384E-01	2750.00	0.9832E-03
250.00	0.3563E-01	2775.00	0.9710E-03
275.00	0.2979E-01	2800.00	0.9591E-03
300.00	0.2550E-01	2825.00	0.9474E-03
325.00	0.2221E-01	2850.00	0.9360E-03
350.00	0.1960E-01	2875.00	0.9248E-03
375.00	0.1749E-01	2900.00	0.9138E-03

400.00	0.1576E-01	2925.00	0.9031E-03
425.00	0.1432E-01	2950.00	0.8926E-03
450.00	0.1309E-01	2975.00	0.8822E-03
475.00	0.1205E-01	3000.00	0.8721E-03
500.00	0.1114E-01	3025.00	0.8622E-03
525.00	0.1034E-01	3050.00	0.8525E-03
550.00	0.9635E-02	3075.00	0.8430E-03
575.00	0.9013E-02	3100.00	0.8336E-03
600.00	0.8459E-02	3125.00	0.8244E-03
625.00	0.7962E-02	3150.00	0.8155E-03
650.00	0.7515E-02	3174.99	0.8066E-03
675.00	0.7109E-02	3199.99	0.7980E-03
700.00	0.6741E-02	3225.00	0.7895E-03
725.00	0.6405E-02	3250.00	0.7811E-03
750.00	0.6098E-02	3275.00	0.7729E-03
775.00	0.5815E-02	3300.00	0.7649E-03
800.00	0.5555E-02	3325.00	0.7570E-03
825.00	0.5314E-02	3350.00	0.7492E-03
850.00	0.5091E-02	3375.00	0.7416E-03
875.00	0.4884E-02	3400.00	0.7341E-03
900.00	0.4691E-02	3425.00	0.7267E-03
925.00	0.4512E-02	3450.00	0.7195E-03
950.00	0.4343E-02	3475.00	0.7124E-03
975.00	0.4186E-02	3500.00	0.7054E-03
1000.00	0.4038E-02	3525.00	0.6985E-03
1025.00	0.3899E-02	3550.00	0.6917E-03
1050.00	0.3768E-02	3575.00	0.6851E-03
1075.00	0.3644E-02	3600.00	0.6786E-03
1100.00	0.3528E-02	3625.00	0.6721E-03
1125.00	0.3417E-02	3650.00	0.6658E-03
1150.00	0.3313E-02	3675.00	0.6596E-03
1175.00	0.3214E-02	3700.00	0.6535E-03
1200.00	0.3120E-02	3725.00	0.6474E-03
1225.00	0.3030E-02	3750.00	0.6415E-03
1250.00	0.2945E-02	3775.00	0.6357E-03
1275.00	0.2863E-02	3800.00	0.6299E-03
1300.00	0.2786E-02	3825.00	0.6243E-03
1325.00	0.2712E-02	3850.00	0.6187E-03
1350.00	0.2642E-02	3875.00	0.6132E-03
1375.00	0.2575E-02	3900.00	0.6078E-03
1400.00	0.2511E-02	3925.00	0.6025E-03
1425.00	0.2450E-02	3950.00	0.5973E-03
1450.00	0.2391E-02	3975.00	0.5921E-03

1475.00	0.2334E-02	4000.00	0.5870E-03
1500.00	0.2280E-02	4025.00	0.5820E-03
1525.00	0.2228E-02	4050.00	0.5771E-03
1550.00	0.2178E-02	4075.00	0.5722E-03
1575.00	0.2130E-02	4100.00	0.5675E-03
1600.00	0.2084E-02	4125.00	0.5627E-03
1625.00	0.2039E-02	4150.00	0.5581E-03
1650.00	0.1996E-02	4175.00	0.5535E-03
1675.00	0.1953E-02	4200.00	0.5490E-03
1700.00	0.1913E-02	4225.00	0.5445E-03
1725.00	0.1875E-02	4250.00	0.5401E-03
1750.00	0.1838E-02	4275.00	0.5358E-03
1775.00	0.1802E-02	4300.00	0.5315E-03
1800.00	0.1767E-02	4325.00	0.5273E-03
1825.00	0.1734E-02	4350.00	0.5231E-03
1850.00	0.1701E-02	4375.00	0.5190E-03
1875.00	0.1670E-02	4400.00	0.5150E-03
1900.00	0.1640E-02	4425.00	0.5110E-03
1924.99	0.1610E-02	4450.00	0.5070E-03
1950.00	0.1582E-02	4475.00	0.5032E-03
1975.01	0.1554E-02	4500.00	0.4993E-03
2000.01	0.1527E-02	4525.00	0.4955E-03
2025.00	0.1501E-02	4550.00	0.4918E-03
2050.00	0.1476E-02	4575.00	0.4881E-03
2075.00	0.1451E-02	4600.00	0.4845E-03
2100.00	0.1426E-02	4625.00	0.4809E-03
2125.00	0.1403E-02	4650.00	0.4773E-03
2150.00	0.1381E-02	4675.00	0.4738E-03
2175.00	0.1359E-02	4700.00	0.4704E-03
2200.00	0.1338E-02	4725.00	0.4670E-03
2225.00	0.1317E-02	4750.00	0.4636E-03
2250.00	0.1297E-02	4775.00	0.4603E-03
2275.00	0.1277E-02	4800.00	0.4570E-03
2300.00	0.1258E-02	4825.00	0.4537E-03
2325.00	0.1239E-02	4850.00	0.4505E-03
2350.00	0.1221E-02	4875.00	0.4474E-03
2375.00	0.1204E-02	4900.00	0.4442E-03
2400.00	0.1186E-02	4925.00	0.4411E-03
2425.00	0.1169E-02	4950.00	0.4381E-03
2450.00	0.1153E-02	4975.00	0.4351E-03
2475.00	0.1137E-02	5000.00	0.4321E-03
2500.00	0.1121E-02		

*********************** AERSCREEN MAXIMUM IMPACT SUMMARY
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3-hour, 8-hour, and 24-hour scaled
concentrations are equal to the 1-hour concentration as referenced in
SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY
IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)
Report number EPA-454/R-92-019
http://www.epa.gov/scram001/guidance_permit.htm
under Screening Guidance

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.1286	0.1286	0.1286	0.1286	N/A

DISTANCE FROM SOURCE 153.00 meters

IMPACT AT THE AMBIENT BOUNDARY	0.1133	0.1133	0.1133	0.1133	N/A

DISTANCE FROM SOURCE 1.00 meters